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Liang

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(54) **FUSE BOX**

(76) Inventor: **Wen Liang**, 10/F., No. 65, Changshou 2nd St., Wufu Tsun, Luchu Hsiang, Taoyuan County (TW)

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(52) **U.S. Cl.** **439/621**; 439/830; 439/811
(58) **Field of Search** 439/620, 621, 439/431, 811, 830–833

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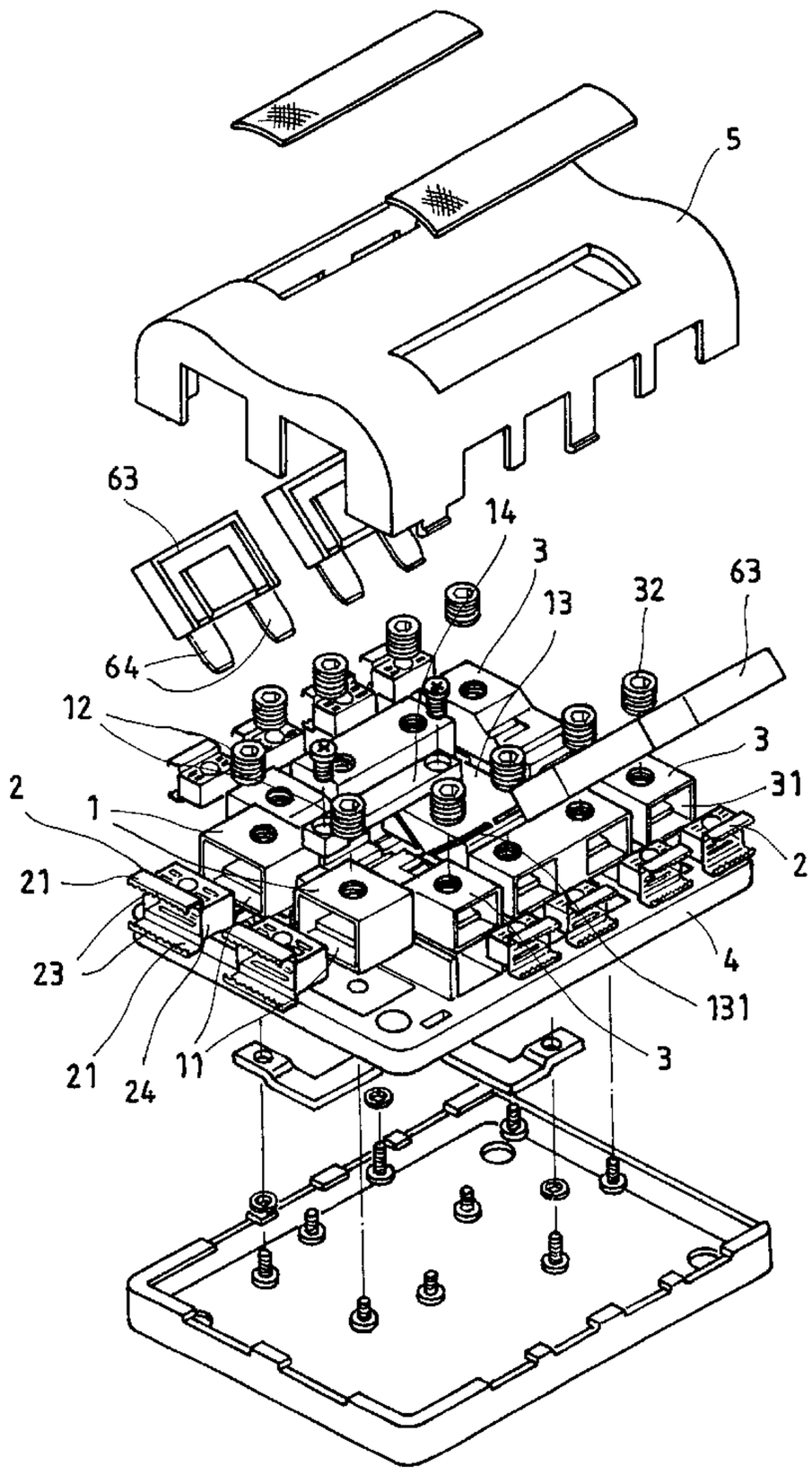
Primary Examiner—Hien Vu
(74) *Attorney, Agent, or Firm*—Rosenberg, Klein & Lee

(57) **ABSTRACT**

A fuse box in which wire distribution blocks each have a receiving chamber and a metal wire clip in the receiving chamber, and tightening up screws are respectively threaded into the wire distribution blocks to compress the respective metal wire clips and to force the respective metal wire clips into positive engagement with respective electric wires. Metal spring plates are mounted in respective oblique insertion holes in the wire distribution blocks to hold fuses in a tilted position, so that less vertical installation space is occupied.

5 Claims, 8 Drawing Sheets



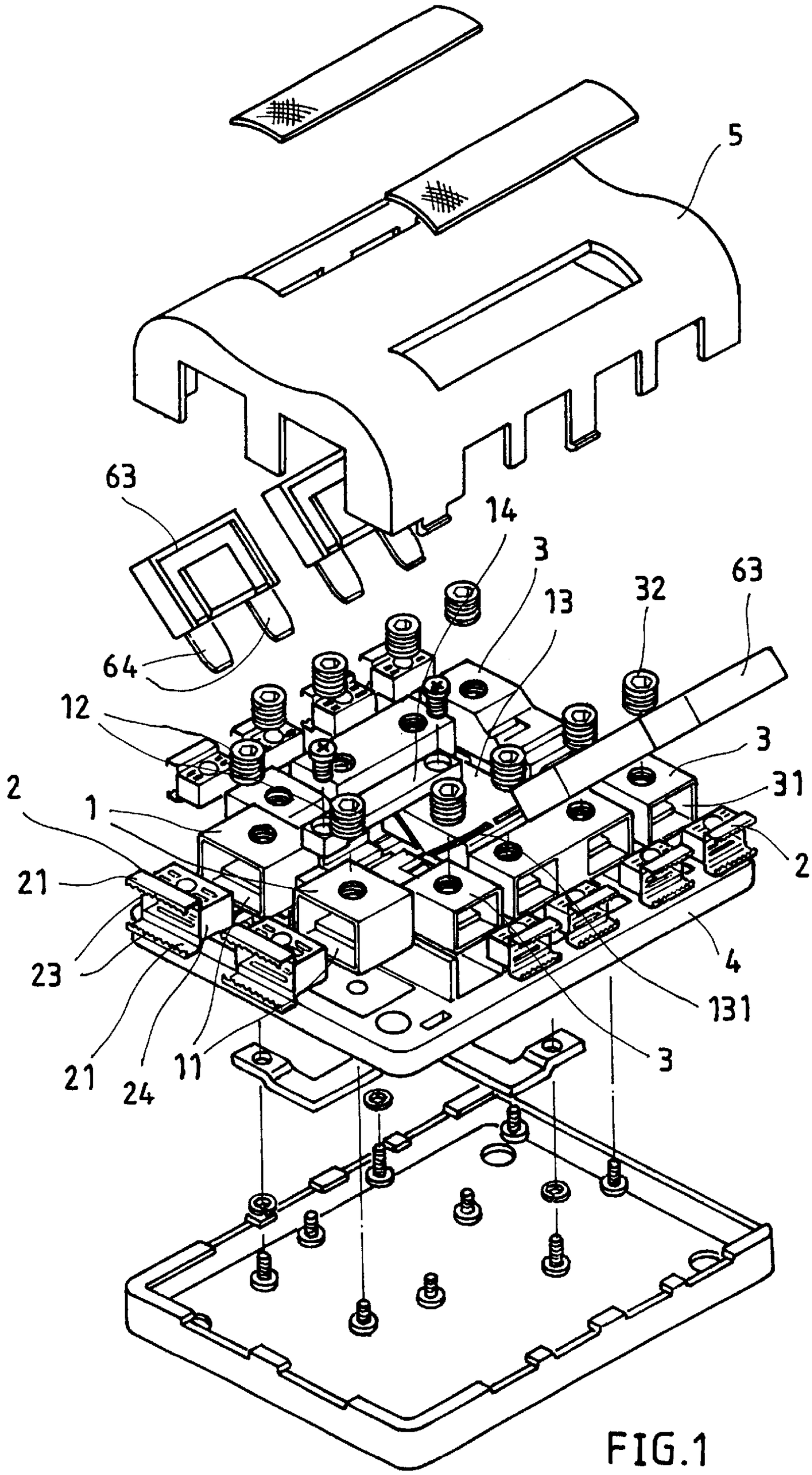


FIG.1

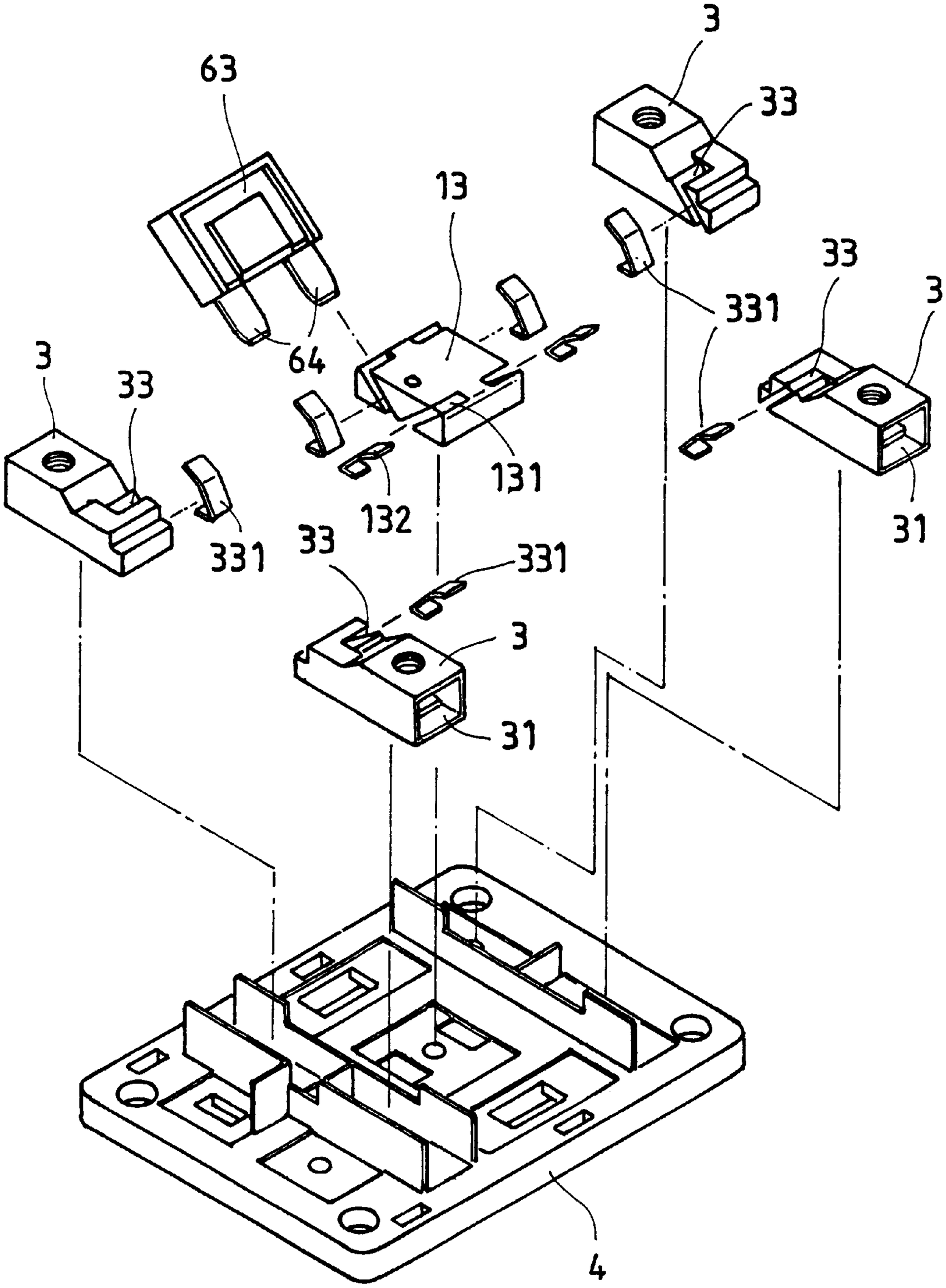


FIG.2

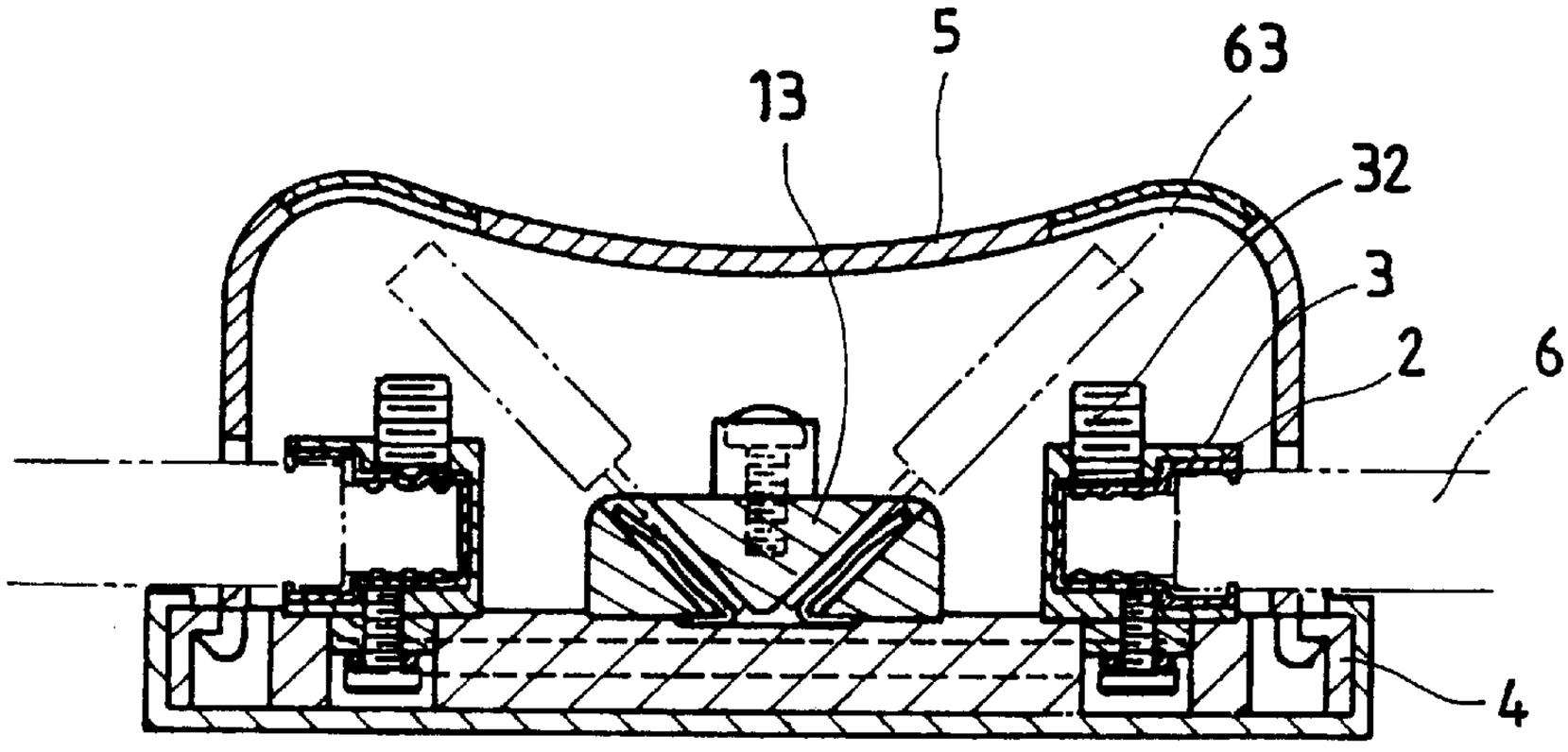


FIG.3

FIG.4

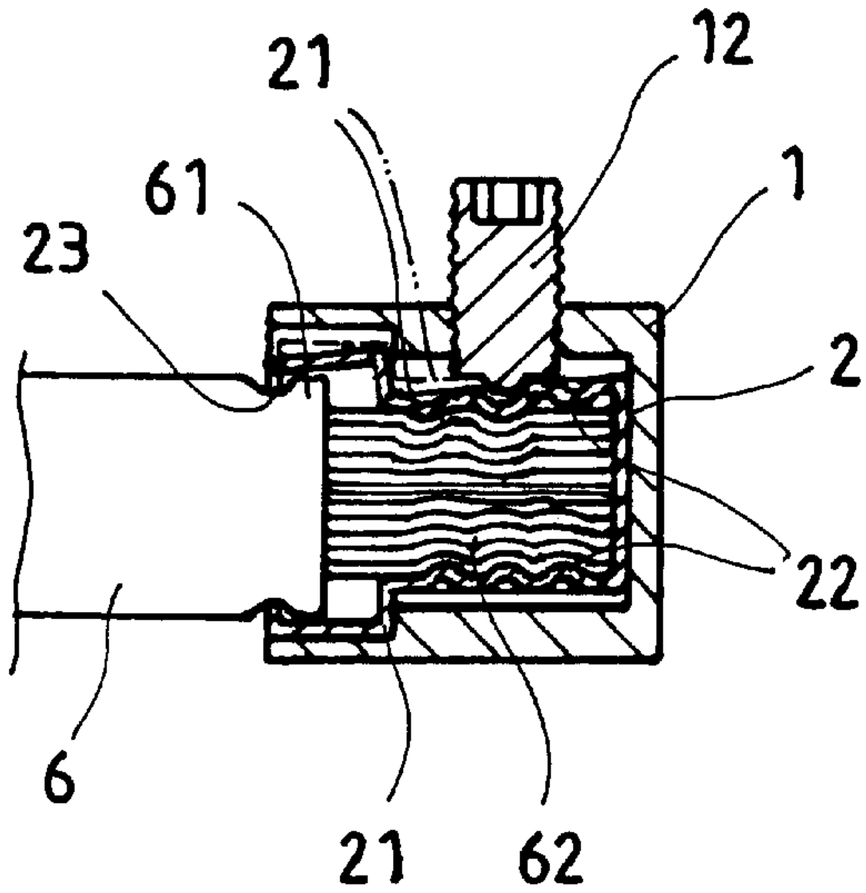


FIG.5

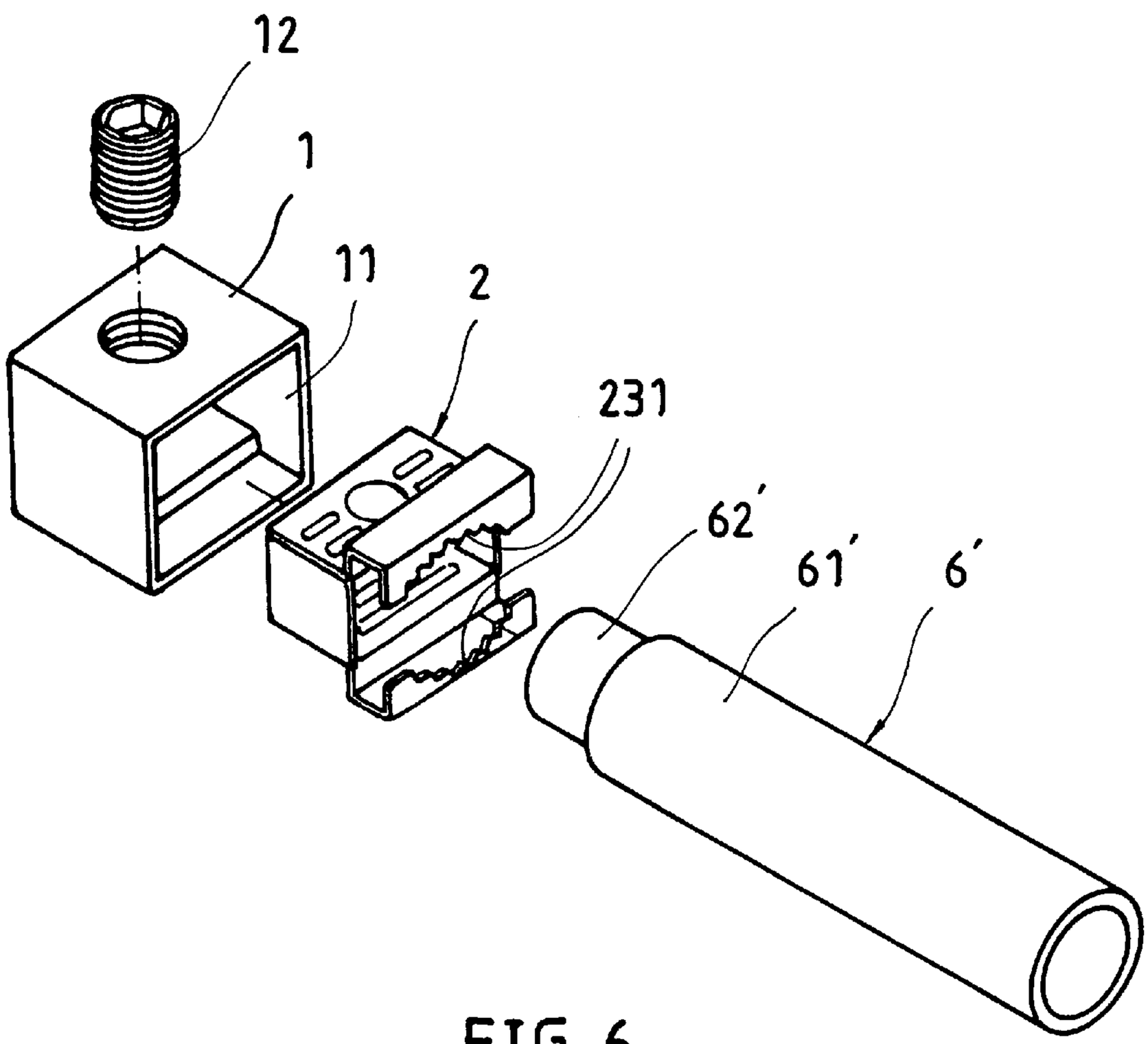


FIG.6

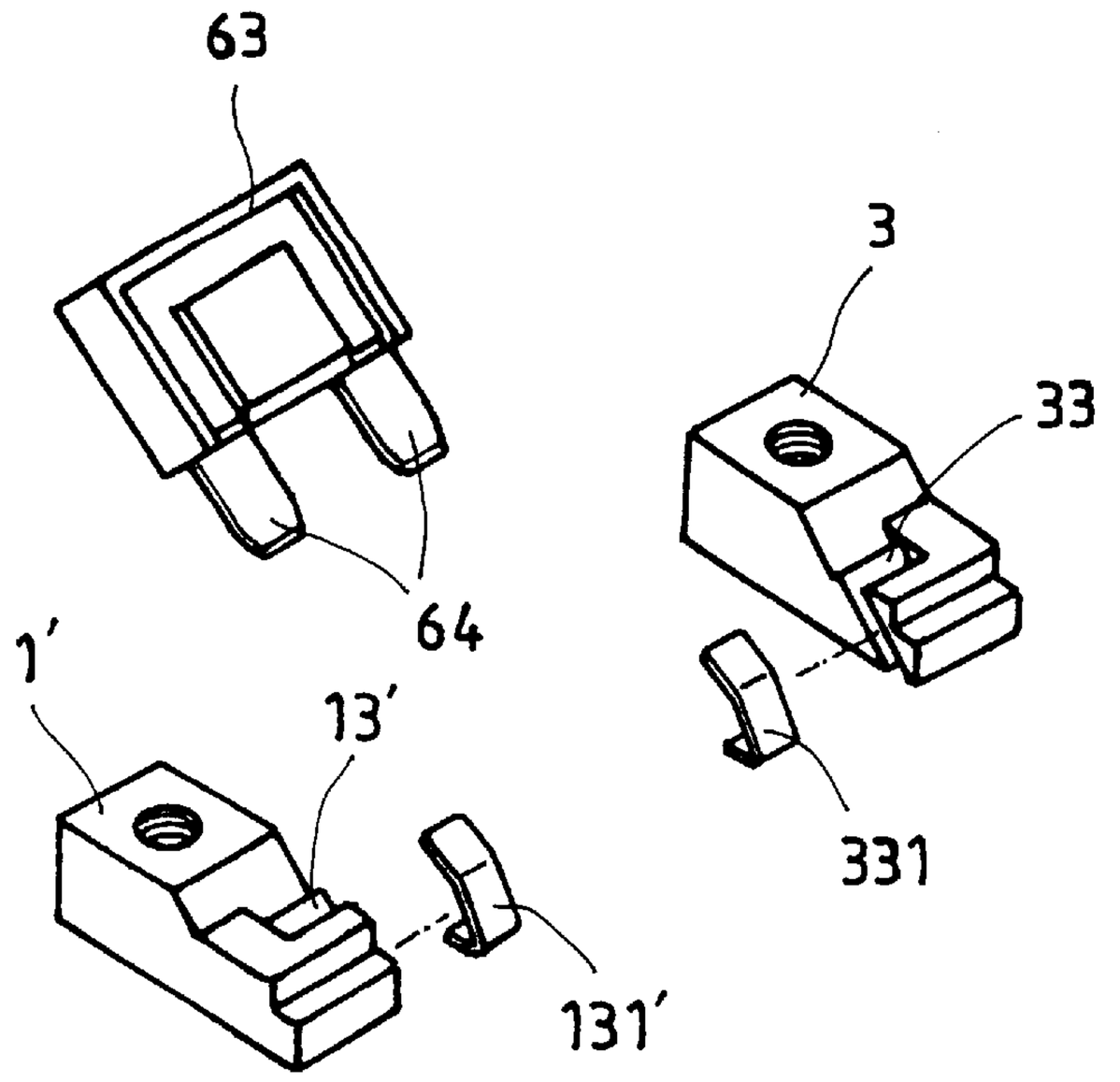


FIG.7

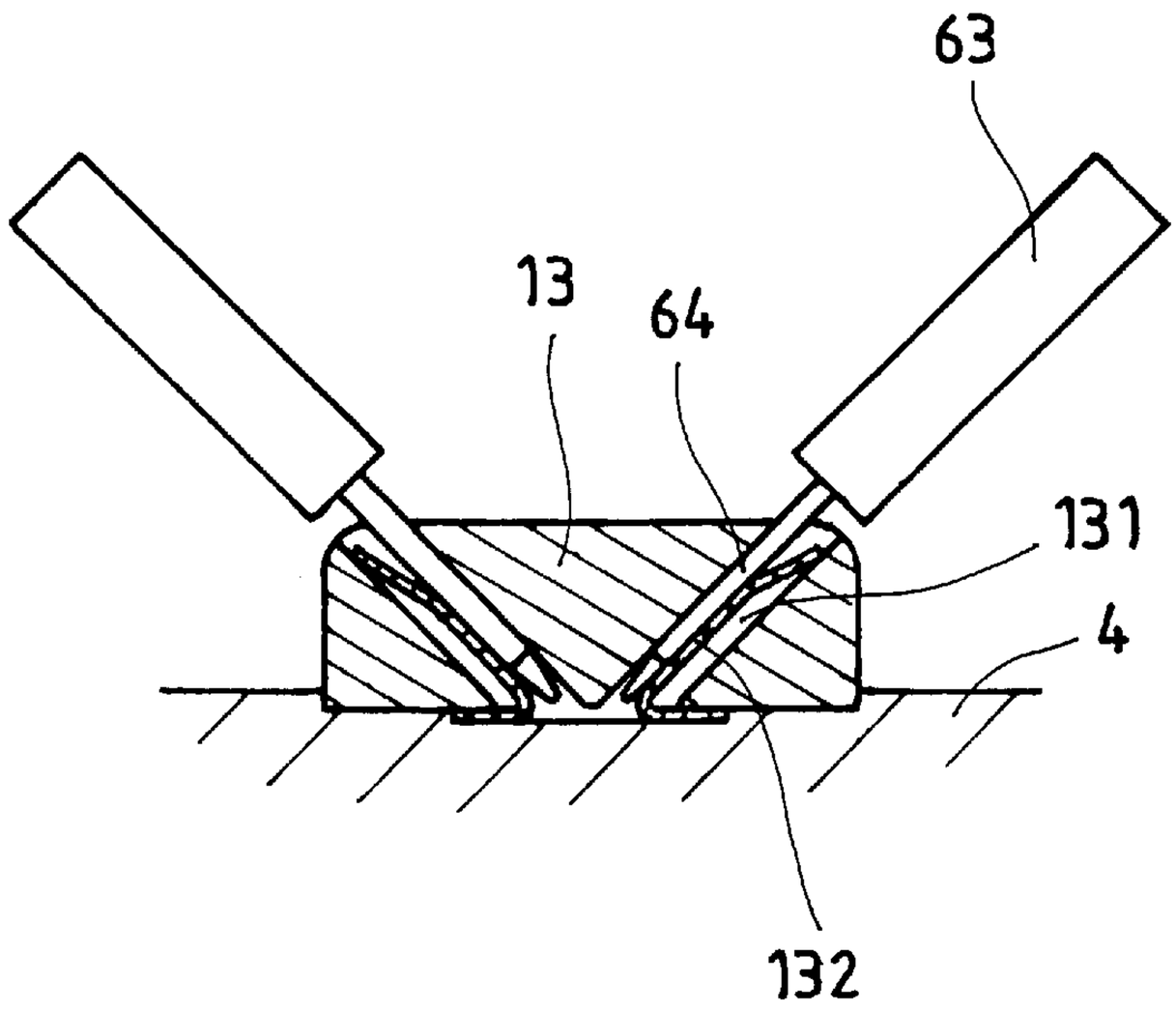


FIG.8

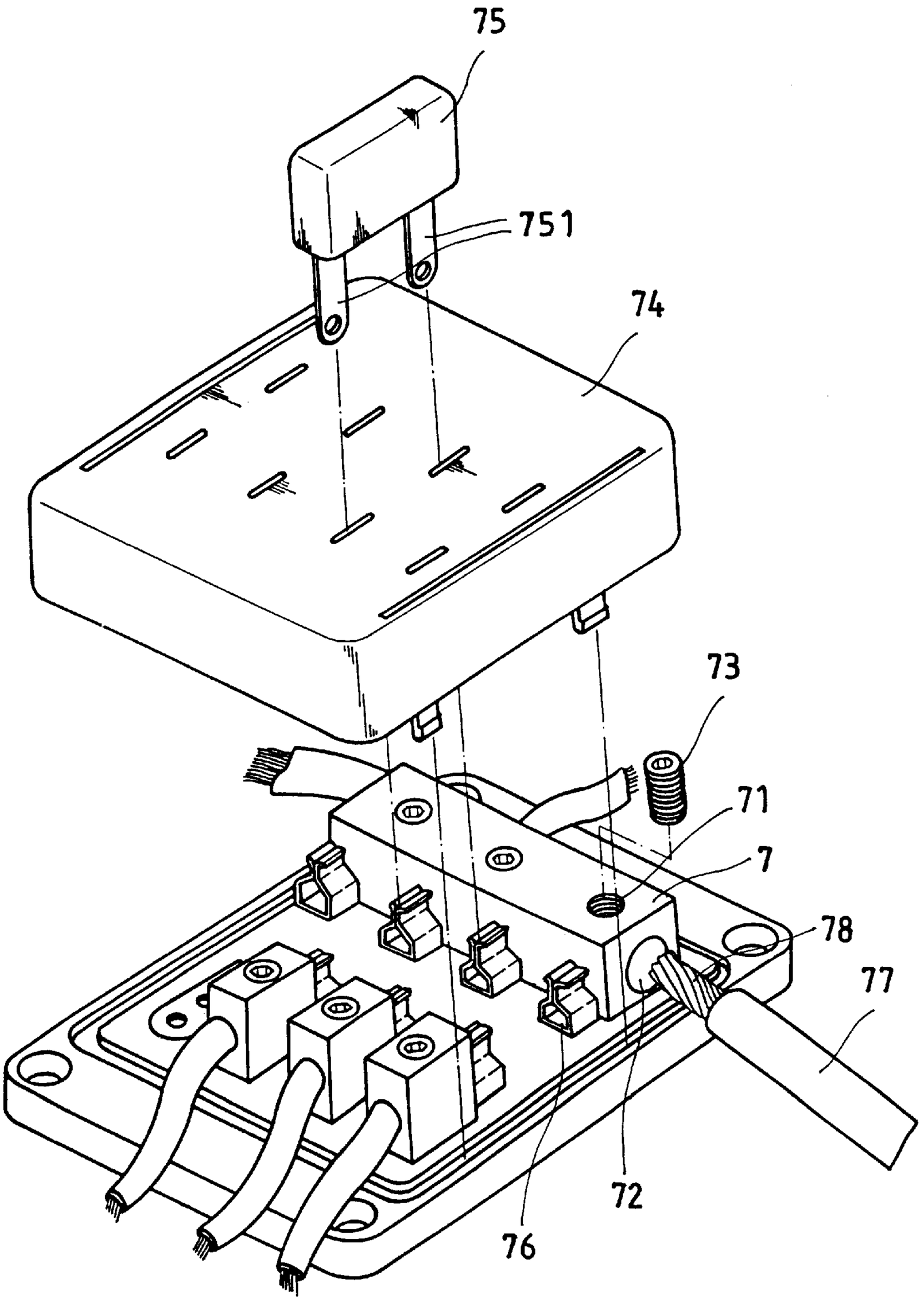


FIG.9
PRIOR ART

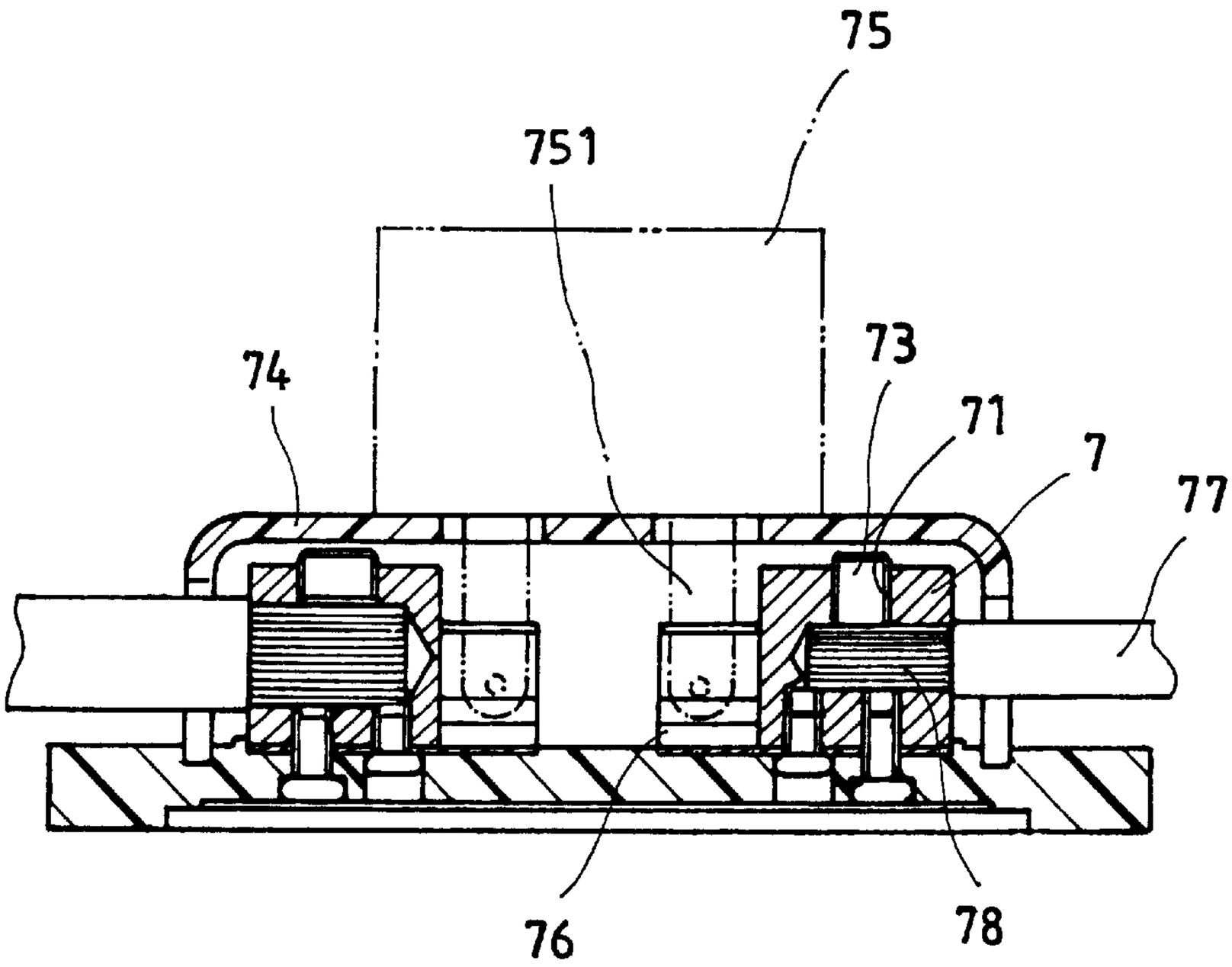


FIG.10
PRIOR ART

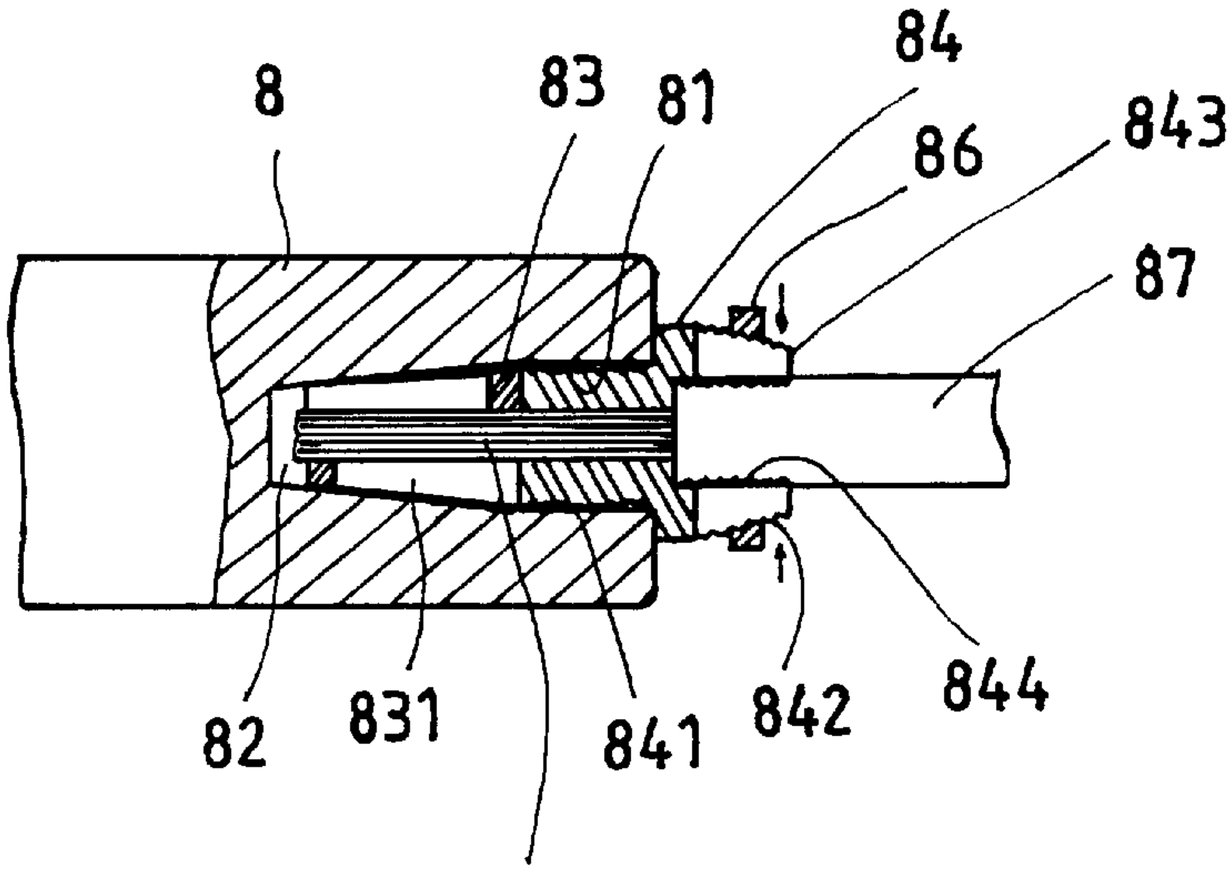


FIG.12
PRIOR ART

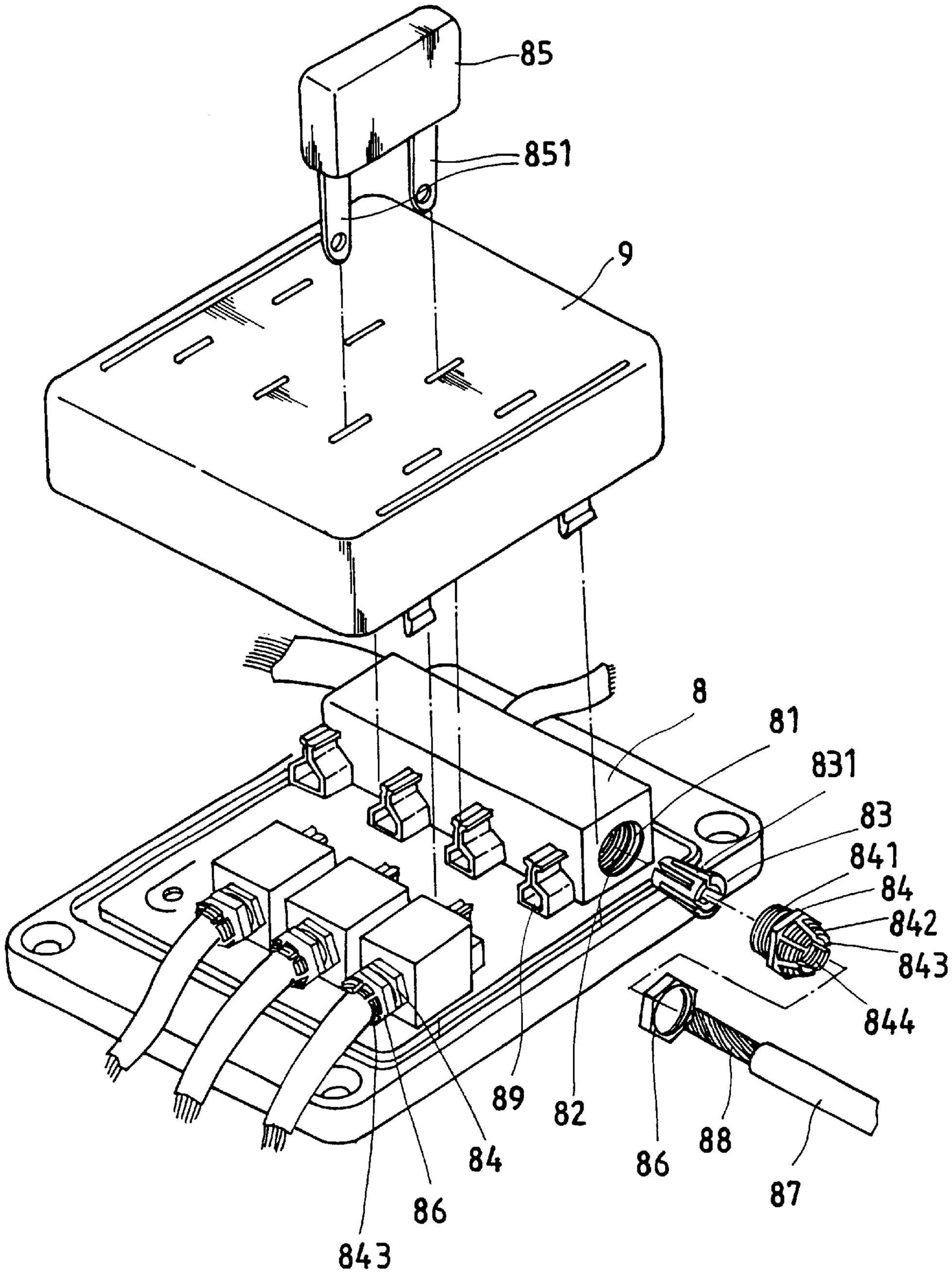


FIG.11
PRIOR ART

FUSE BOX

BACKGROUND OF THE INVENTION

The present invention relates to a fuse box and, more particularly, to such a fuse box that is easy to install and that keeps the electric wires positively in the connected position when installed.

FIGS. **9** and **10** show a fuse box according to the prior art. According to this design, the electric wire **77** is inserted into a wire hole **72** of the distribution block **7**, and a pointed screw rod **73** is threaded into a screw hole **71** of the distribution block **7** to hold down the core **78** of the electric wire **77**. This design has drawbacks. Because the tightening up screw sues its pointed tip to hold down the core of the electric wire, the electric wire tends to be pulled away from the wire distribution block. Further, much driving force must be employed to the tightening up screw during installation, and the core of the electric wire tends to be broken when driving the tightening up screw into the screw hole of the wire distribution block to hold down the core of the electric wire.

FIGS. **11** and **12** show another structure of fuse box according to the prior art. According to this design, the wire distribution block **8** has a tapered wire hole **82** and an inner thread **81** around the orifice of the tapered wire hole **82**. A wire clamp **83** is mounted on the core **88** of the electric wire **87** and inserted with the core **88** of the electric wire **87** into the tapered wire hole **82**. The wire clamp **83** has longitudinal splits **831**. A connector **84** is mounted on the electric wire **87** and fastened to the tapered wire hole **82** to force the wire clamp **83** into engagement with the periphery of the core **88** of the electric wire **87**. The connector **84** has one end terminating in a screw tube **841** and threaded into the inner thread **81** of the wire distribution block **8**, and an opposite end terminating in a plurality of equiangularly spaced clamping strips **843**. The clamping strips **843** have outer threads **842** and inner ribs **844**. When threading the screw tube **841** into the inner thread **81** of the wire distribution block **8**, the wire clamp **83** is forced by the connector **84** into the inside of the tapered wire hole **82**, thereby causing the wire clamp **83** to be radially inwardly forced by the tapered peripheral wall of the tapered wire hole **82** into engagement with the periphery of the core **88** of the electric wire **87**. Further, a lock nut **86** is threaded onto the outer threads **842** of the clamping strips **843** of the connector **84**, forcing the inner rids **844** of the clamping strips **83** into engagement with the electrically insulative shell of the electric wire **87**. This design is complicated. Because many component parts are used, the manufacturing cost of this design of fuse box is expensive. Further, the installation procedure of this design of fuse box is also complicated.

Further, in the aforesaid prior art fuse boxes, metal fuse clamps **76;89** are respectively welded to the wire distribution blocks **7;8**, and adapted to receive the terminals **751** ; **851** of fuses **75;85**. These metal fuse clamps **76;89** provide less clamping force to the terminals **751**; **851** of installed fuses **75;85**, and installed fuses **75;85** tend to be forced out of position accidentally. Furthermore, because fuses **75;85** are to be installed in the top cover **74;9** of the fuse box in vertical, much vertical installation space is required.

SUMMARY OF THE INVENTION

The present invention has been accomplished to provide a fuse box, which eliminates the aforesaid drawbacks. According to one aspect of the present invention, the fuse box comprises a mount, a plurality of wire distribution blocks respectively fixedly mounted on the mount, the wire distribution blocks including one power input distribution and a plurality of power output distribution blocks, a plurality of metal wire clips respectively mounted in the wire distribution blocks and adapted to secure the core of a respective electric wire, the metal wire clips each comprising two horizontal clamping walls horizontally disposed at different elevations and having a respective serrated portion for engaging the electrically insulative shell of an electric wire, and two vertical support walls bilaterally disposed between the horizontal clamping walls and defining with the horizontal clamping walls a receiving space adapted to receive the core of an electric wire, and a plurality of tightening up screws respectively threaded into a respective screw hole in the wire distribution blocks to force the serrated portions of the metal wire clips into engagement with the electrically insulative shell of the respective electric wires being inserted into the wire distribution blocks. According to another aspect of the present invention, the wire distribution blocks each have at least one oblique insertion slot and a respective metal spring plate mounted in each oblique insertion slot and adapted to receive the terminals of fuses positively.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded view of a fuse box according to the present invention.

FIG. **2** is an exploded view of a part of the fuse box according to the present invention.

FIG. **3** is an installed view in section of the fuse box according to the present invention.

FIG. **4** is an exploded view showing the positioning of a metal wire clip between one wire distribution block and an electric wire of rectangular cross section according to the present invention.

FIG. **5** is a sectional assembly view of FIG. **4**

FIG. **6** is an exploded view showing the positioning of a metal wire clip between one wire distribution block and an electric wire of circular cross section according to the present invention.

FIG. **7** is an exploded view showing the positioning of a fuse between the power input distribution block and one power output distribution block according to the present invention.

FIG. **8** is a sectional view showing two fuses obliquely installed in the center distribution block according to the present invention.

FIG. **9** is an exploded view of a fuse box according to the prior art.

FIG. **10** is a sectional assembly view of the prior art fuse box shown in FIG. **9**.

FIG. **11** is an exploded view of another structure of fuse box according to the prior art.

FIG. **12** is a sectional view of a part of the prior art fuse box of FIG. **11**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. from **1** through **5**, a fuse box is shown comprising an electrically insulative flat mount **4**. Electrically insulative wire distribution blocks **1;3** are fixedly mounted on the top sidewall of the flat mount **4** for the wiring of electric wires **6**. Each wire distribution block **1** or

3 has at least one receiving chamber **11** or **31** and a metal wire clip **2** mounted in each receiving chamber **11** or **31**. The metal wire clip **2** comprises to horizontal clamping walls **21** horizontally disposed at different elevations, and two vertical support walls **24** bilaterally disposed between the horizontal clamping walls **21**. The horizontal clamping walls **21** and the vertical support walls **24** define a receiving space adapted to receive the core **62** of an electric wire **6**. The horizontal clamping walls **21** each have transverse ribs **22** respectively formed integral with the respective inner surface, and a front side terminating in a serrated clamping portion **23**. The horizontal clamping walls **21** have the respective serrated clamping portion **23** facing each other. After insertion of the core **62** of an electric wire **6** in the receiving space defined within the metal wire clip **2** in the receiving chamber **11** or **31** of one wire distribution block **1** or **3**, a tightening up screw **12** or **32** is fastened to the wire distribution block **1** or **3** and pressed against the respective metal wire clip **2** to force the serrated clamping portion **23** of each of the horizontal clamping walls **21** into engagement with the electrically insulative shell **61** of the inserted electric wire **6**. The serrated clamping portions **23** of the horizontal clamping walls **21** may be designed to fit the core **62** of an electric wires **6** of rectangular cross section as shown in FIG. **4**, or to fit the core **62'** of an electric wires **6'** of circular cross section as shown in FIG. **6**.

The aforesaid wire distribution blocks **1;3** include one power input distribution block **1** for power input and a plurality of power output distribution blocks **3** for power output. A center distribution block **13** is fixedly mounted on the top sidewall of the electrically insulative flat mount **4** at the center. A metal conductive plate **14** is connected between the center distribution block **13** and the power input distribution block **1**, enabling input power supply to be transmitted from the power input distribution block **1** to the power output distribution blocks **3** through the center distribution block **13**. The center distribution block **13** has a plurality of oblique insertion slots **131** adapted to receive one terminal **64** of a fuse **63**. The power output distribution blocks **3** each have an oblique insertion slot **33** corresponding to one oblique insertion slot **131** of the center distribution block **13** adapted to receive one terminal **64** of a fuse **63**. Metal spring plates **132;331** are respectively mounted in the oblique insertion slots **131;33** and adapted to hold down the terminals **64** of inserted fuses **63**. When one fuse **63** is installed, the two terminals **64** of the inserted fuse **63** are respectively inserted into one oblique insertion slot **131** of the center distribution block **13** and the oblique insertion slot **33** of one power output distribution block **3**, and maintained in close contact with the metal spring plates **132;331** in the respective oblique insertion slots **131;33**. After installation, an electrically insulative top cover shell **5** is closed on the electrically insulative flat mount **4**. Because fuses **63** are maintained in a tilted position after installation, the height of the fuse box is greatly reduced (see FIGS. **3** and **8**).

Referring to FIG. **7**, the power input distribution block **1'** is made having an oblique insertion slot **13'** and a metal spring plate **131'** mounted in the oblique insertion slot **13'**. The two terminals **64** of a fuse **63** are directly inserted into the oblique insertion slot **13'** of the power input distribution block **1'** and the oblique insertion slot **33** of one power output distribution block **3** to contact the respective metal spring plates **131';331**, i.e., the fuse **63** transmits power supply from the power input distribution block **1'** to the power output distribution block **3** and automatically cuts off the circuit between the power input distribution block **1'** and the power output distribution block **3** upon an overload.

It is to be understood that the drawings are designed for purposes of illustration only, and are not intended for use as a definition of the limits and scope of the invention disclosed.

What the invention claimed is:

1. A fuse box comprising:

a mount;

a plurality of wire distribution blocks respectively fixedly mounted on said mount, said wire distribution blocks including one power input distribution and a plurality of power output distribution blocks each having at least one receiving chamber at one side;

a plurality of metal wire clips respectively mounted in the receiving chamber of each of said wire distribution blocks and adapted to secure a core of an electric wire, said metal wire clips each comprising two horizontal clamping walls horizontally disposed at different elevations, and two vertical support walls bilaterally disposed between said horizontal clamping walls, said vertical support walls and said horizontal clamping walls defining a receiving space adapted to receive the core of an electric wire, said horizontal clamping walls each having a plurality of transverse ribs formed on an inner surface thereof and having a front end terminating at a serrated portion forming a plurality of teeth projections for conformingly and securely engaging an insulative shell of an electric wire; and,

a plurality of tightening up screws threaded into respective screw holes formed in said wire distribution blocks for depressing said metal wire clips, the serrated portions of each said metal wire clips being thereby forced into engagement with an insulative shell of the electric wire inserted into one of said wire distribution blocks.

2. The fuse box as claimed in claim **1** wherein said serrated portions of said metal wire clips each extend to generally form an acuate concavity for engaging a circular cross section of the electric wire in conformed manner.

3. A fuse box comprising:

a mount;

a plurality of wire distribution blocks respectively fixedly mounted on said mount, said wire distribution blocks including one power input distribution and a plurality of power output distribution blocks each having at least one receiving chamber at one side;

a plurality of metal wire clips respectively mounted in the receiving chamber of each of said wire distribution blocks and adapted to secure a core of an electric wire, said metal wire clips each comprising two horizontal clamping walls horizontally disposed at different elevations, and two vertical support walls bilaterally disposed between said horizontal clamping walls, said vertical support walls and said horizontal clamping walls defining a receiving space adapted to receive the core of an electric wire, said horizontal clamping walls each having a plurality of transverse ribs formed on an inner surface thereof and having a front end terminating at a serrated portion for conformingly and securely engaging an insulative shell of an electric wire; and

a plurality of tightening up screws threaded into respective screw holes formed in said wire distribution blocks for depressing said metal wire clips, the serrated portions of each said metal wire clip being thereby forced into engagement with an insulative shell of the electric wire inserted into one of said wire distribution block;

said power input distribution block has an oblique insertion slot and a metal spring plate mounted in the

oblique insertion slot for receiving one terminal of a fuse, and said power output distribution blocks each have an oblique insertion slot corresponding to one oblique insertion slot of said power input distribution block and a metal spring plate mounted in the oblique insertion slot for receiving one terminal of a fuse.

4. A fuse box comprising:

a mount;

a plurality of wire distribution blocks respectively fixedly mounted on said mount, said wire distribution blocks including one power input distribution and a plurality of power output distribution blocks each having at least one receiving chamber at one side;

a plurality of metal wire clips respectively mounted in the receiving chamber of each of said wire distribution blocks and adapted to secure a core of an electric wire, said metal wire clips each comprising two horizontal clamping walls horizontally disposed at different elevations, and two vertical support walls bilaterally disposed between said horizontal clamping walls, said vertical support walls and said horizontal clamping walls defining a receiving space adapted to receive the core of an electric wire, said horizontal clamping walls each having a plurality of transverse ribs formed on an inner surface thereof and having a front end terminating at a serrated portion forming a plurality of teeth projections for conformingly and securely engaging an insulative shell of an electric wire; and

a plurality of tightening up screws threaded into respective screw holes formed in said wire distribution blocks for depressing said metal wire clips, the serrated portions in said metal wire clips being thereby forced into engagement with an insulative shell of the electric wire inserted into one of said wire distribution block;

a center distribution block fixedly mounted on center of said mount for connection to said power output distribution blocks by fuse for transmission power supply from said power input distribution block to said power output distribution blocks; and,

a metal conductive plate connected between said center distribution block and said power input distribution block for enabling power supply to be transmitted from said power input distribution block to said center distribution block and then from said center distribution block to said power output distribution blocks by fuse coupling.

5. A fuse box comprising:

a mount;

a plurality of wire distribution blocks respectively fixedly mounted on said mount, said wire distribution blocks including one power input distribution and a plurality of power output distribution blocks each having at least one receiving chamber at one side;

a plurality of metal wire clips respectively mounted in the receiving chamber of each of said wire distribution blocks and adapted to secure a core of an electric wire, said metal wire clips each comprising two horizontal clamping walls horizontally disposed at different elevations, and two vertical support walls bilaterally disposed between said horizontal clamping walls, said vertical support walls and said horizontal clamping walls defining a receiving space adapted to receive the core of an electric wire, said horizontal clamping walls each having a plurality of transverse ribs formed on an inner surface thereof and having a front end terminating at a serrate portion for conformingly and securely engaging an insulative shell of an electric wire;

a plurality of tightening tip screws threaded into respective screw holes formed in said wire distribution blocks for depressing said metal wire clips, the serrated portions of each said metal wire clip being thereby forced into engagement with an insulative shell of the electric wire inserted into one of said wire distribution blocks;

a center distribution block fixedly mounted at a center of said mount for connection to said power output distribution blocks by fuse for transmission power supply from said power input distribution block to said power output distribution blocks; and,

a metal conductive plate connected between said center distribution block and said power input distribution block for enabling power supply to be transmitted from said power input distribution block to said center distribution block and then from said center distribution block to said power output distribution blocks by fuse coupling;

said power output distribution blocks each have an oblique insertion slot and a metal spring plate mounted in the respective oblique insertion slot for receiving one terminal of a respective fuse, and said center distribution block has a plurality of oblique insertion slots corresponding to the oblique insertion slot of each of said power output distribution blocks and a plurality of metal spring plates respectively mounted in the respective oblique insertion slots for receiving one terminal of a respective fuse.

* * * * *